What is Claimed

1. An electrostatic fluid accelerator comprising:

a high voltage power source supplying a high voltage power at a particular output voltage and current, said voltage and current waveforms each including constant and alternating components; and

an electrostatic fluid accelerator unit comprising a plurality of stages of electrodes, each of said stages of electrodes including at least one corona discharge electrode and at least one complementary electrode, said stages of electrodes arranged in tandem to sequentially accelerate a fluid passing therethrough, said electrodes connected to said high voltage power source to receive said high voltage power with substantially identical waveforms of said alternating component of said output voltage.

2. The electrostatic fluid accelerator according to claim 1 wherein said high voltage power is supplied to each of said plurality of stages of electrostatic discharge elements substantially in phase and with substantially equal levels of said alternating component of said output voltage.

3. The electrostatic fluid accelerator according to claim 1 wherein said high voltage power is supplied to each of said plurality of stages of electrodes substantially in phase and with substantially equal levels of said components of said output currents.

4. The electrostatic fluid accelerator according to claim 1 wherein said high voltage power source comprises a plurality of converters for transforming and a

primary power to said high voltage power, each of said converters independently connected to a respective one of said stages for providing said high voltage power thereto, said high voltage power source further comprising a controller connected to said converters for synchronizing said alternating components of said high voltage power provided by said converters.

5. The electrostatic fluid accelerator according to claim 4 wherein said converters each comprise a transformer and a rectifier circuit.

6. The electrostatic fluid accelerator according to claim 1 wherein said alternating component of said output voltage has a frequency range within 50 Hz to 1000 kHz, each of said stages of electrostatic discharge elements receiving said alternating voltage component in phase and with substantially equal amplitude.

7. The electrostatic fluid accelerator according to claim 1 wherein said alternating component of said current has a frequency range within 50 Hz to 1000 kHz, each of said stages of electrodes receiving said alternating current component in phase with each other and with substantially equal amplitudes.

8. The electrostatic fluid accelerator according to claim 1 wherein each of said stages of said electrode comprises a first regular array of corona discharge electrodes and a second regular array of accelerating electrodes, said corona discharge electrodes and accelerating electrodes oriented parallel to each other and each of said arrays of corona discharge electrodes spaced from each of said arrays of said accelerating electrodes of the same stage, corresponding ones of said electrodes of

different ones of said stages being parallel to each other and to the electrodes of a nearest stage.

9. The electrostatic fluid accelerator according to claim 8 wherein corona discharge electrodes and accelerating electrodes of respective immediately adjacent ones of said stages are spaced apart by a distance d that is 1 to 2 times greater than a closest distance between ones of said corona discharge electrodes and immediately adjacent ones of the electrodes of each of said stages.

10. The electrostatic fluid accelerator according to claim 1 wherein each of said stages includes a plurality of corona discharge electrodes located in a common transverse plane, each of said transverse planes being substantially orthogonal to an airflow direction and ones of said corona discharge electrodes of neighboring ones of said stages located in respective common planes orthogonal to said transverse planes.

11. The electrostatic fluid accelerator according to claim 1 wherein each of said stages includes a plurality of parallel corona discharge wires positioned in a first plane and a plurality of parallel accelerating electrodes having edges closest to the corona discharge electrodes aligned in respective second plane, said first and second planes parallel to each other and perpendicular to a common average airflow direction through said stages.

12. An electrostatic fluid accelerator comprising:

a high voltage power source supplying a high voltage power including a plurality of output circuits each independently supplying a respective electrical output power signal substantially in phase with each other; and

an electrostatic fluid air accelerator unit comprising a plurality of stages each of said stages including a first array of corona discharge electrodes and a second array of attractor electrodes spaced apart from said first array along an airflow direction, each of said stages connected to a respective one of said output circuits for supplying a corresponding one of said electrical output power signals to said corona discharge and attractor electrodes of corresponding ones of said first and second arrays.

13. The electrostatic fluid accelerator according to claim 12 wherein said high voltage power source said high voltage power further comprises a plurality of transformers, rectifier circuits and controllers connected to respective ones of said output circuits, each of said controllers connected to at least one other of said controllers for synchronizing an said electrical output power signals.

14. The electrostatic fluid accelerator according to claim 12 wherein each of said electrical output power signals has an a.c. component having a fundamental operating frequency within a range of 50 Hz to 1000 kHz.

15. A method of accelerating a fluid including the steps of:

transforming a primary power signal into a plurality of independent voltages each of said voltages including independent high frequency power signals;

synchronizing said plurality of independent high frequency power signals to a common frequency and phase;

powering arrays of corona discharge and accelerating electrodes with respective ones of said high voltages; and

accelerating a the fluid through each of said arrays in sequence.

16. The method according to claim 15 wherein said step of transforming includes steps of increasing a voltage of said primary power signal to provide a plurality of high voltage alternating secondary power signals and independently rectifying said plurality of high voltage alternating secondary power signals to provide a plurality of high voltage output power signals.